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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/264,756	03/09/1999	VENKATESH KRISHNAN	10981459-1	3679

22879 7590 10/20/2003

HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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NGUYEN, DUSTIN

ART UNIT	PAPER NUMBER
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2154

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DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/264,756

Applicant(s)

KRISHNAN ET AL.

Examiner

Dustin Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 20-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 20 – 46 are presented for examination.

***Response to Amendment***

2. As per remark, Applicants argued that (1) Bak does not disclose load class files via a network as needed by an application program.
3. As to point (1), Bak discloses a computer readable storage medium includes system memory and a hard drive, which may be utilized to store and retrieve software programs incorporating computer code that implements the invention. Bak further emphasizes that computer readable storage medium may be in a network including the Internet [ Bak, col 4, lines 34-45 ]. Also, Bak discloses a system which also includes a network interface device [ Bak, col 4, lines 52-54 ].
4. As per remark, Applicants argued that (2) that Ebrahim does not disclose selecting and purging arrays and references from a class structure.

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5. As to point (2), it is rejected for the reasons as mentioned in the previous Office Action mailed on 03/14/2003 which encloses below. Furthermore, Ebrahim discloses locating and searching for object references [ Ebrahim, Abstract; col 4, lines 63-66; and col 10, lines 8-21 ].

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 20-22, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [ US Patent No. 5,999,732 ], in view of Ebrahim et al. [ US Patent No. 5848423 ].

8. As per claim 20, Bak discloses substantially the invention as claimed including a virtual machine [ 107, Figure 3 ], comprising:

class loader that enables the virtual machine to obtain a set of classes via a network as needed while executing an application program [ col 6, lines 1-6 ], the class loader converting the classes obtained via the network into a predefined class definition format and then storing the classes into a class structure in a memory [ col 5, lines 18-34 ], such that the classes stored in the class structure are represented as a set of array and references of the predefined definition format [ col 5, lines 34-41 ];

and to minimize class loading activities on the network [ col 1, lines 7-10 ].

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Bak does not disclose memory manager that selects and purges the arrays and references of the classes from the class structure so as to minimize an amount of the memory consumed by the class structure.

Ebrahim discloses the memory manager [ garbage collector ] that selects and purges the arrays and references of the classes from the class structure so as to minimize an amount of the memory consumed by the class structure [ col 2, lines 26-40 ].

At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

9. As per claim 21, Bak discloses the memory manager deletes a set of objects from the memory which are associated with the classes purges form the class structure [ col 6, lines 9-17 ].

10. As per claim 22, Bak does not disclose a list of associations between the objects and the classes stored in the class structure such that the memory manager deletes the objects in response to the list. Ebrahim discloses a list of associations between the objects and the classes stored in the class structure such that the memory manager deletes the objects in response to the list [ Abstract, lines 8-26 and col 9, lines 50-58 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

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11. As per claim 25, Bak does not disclose a list of hierarchical associations among the classes in the class structure such that the memory manager determines whether the instances of the parent class or of the child class are not being used in response to the list. Ebrahim discloses the list of hierarchical associations among the classes in the class structure such that the memory manager determines whether the instances of the parent class or of the child class are not being used in response to the list [ col 9, lines 60-col 10, lines 7 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

12. As per claim 26, Bak does not disclose the memory manager purges the classes from the class structure at periodic times. Ebrahim discloses the memory manager purges the classes from the class structure at periodic times [ col 2, lines 40-43 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

13. As per claim 27, Bak does not disclose the memory manager purges the classes from the class structure if an amount of available memory falls below a predetermined threshold level. Ebrahim discloses the memory manager purges the classes from the class structure if an amount of available memory falls below a predetermined threshold level [ col 2, lines 44 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

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14. As per claim 28, Bak does not disclose the memory manager purges the classes from the class structure during system idle periods. Ebrahim discloses the memory manager purges the classes from the class structure during system idle periods [ col 2, line 42-43 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

15. As per claims 31, 32, 35-37, they are method claims of claims 20, 21, and 26-28, they are rejected for similar reasons as stated above in claims 20, 21, and 26-28.

16. As per claim 40, it is apparatus claim of claim 20, it is rejected for similar reason as stated in claim 1. Furthermore, Bak discloses memory that holds a class structure for storing a set of classes for use when executing an application program [ 53, Figure 2 ].

17. As per claim 41, it is apparatus claim of claim 21, it is rejected for similar reason as stated in claim 21.

18. As per claims 44-46, they are apparatus of claims 26-28, they are rejected for similar reasons as stated in claims 26-28.

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19. Claims 23, 24, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [ US Patent No. 5,999,732 ], in view of Ebrahim et al. [ US Patent No 5848423 ], and further in view of Shaughnessy [ US Patent No. 5787431 ].

20. As per claims 23 and 24, Bak and Ebrahim do not disclose the memory manager selects a least recently used class in the class structure and purges the arrays and references of the least recently used class from the class structure if an instance of the least recently used class is not being used by the application program. Shaughnessy discloses the memory manager selects a least recently used class in the class structure and purges the arrays and references of the least recently used class from the class structure if an instance of the least recently used class is not being used by the application program [ col 4, lines 57-64 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Shaughnessy because it would allow memory to be available for used in new class structures.

21. As per claim 33, it is method claim of claim 23, it is rejected for similar reason as stated above in claim 23.

22. As per claim 34, Bak and Ebrahim do not disclose the step of determining whether an instance of the least recently used class is being used comprises the step of determining whether an instance of the least recently used class or of a parent class or of a child class of the least recently used class is being used by the application program. Shaughnessy discloses the step of determining whether an instance of the least recently used class is being used comprises the step



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of determining whether an instance of the least recently used class or of a parent class or of a child class of the least recently used class is being used by the application program [ col 10, lines 14-19 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Shaughnessy because it would allow memory to be used for new class structures.

23. As per claims 42 and 43, they are apparatus of claims 23 and 24, they are rejected for similar reasons as stated above in claims 23 and 24.

24. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [ US Patent No. 5,999,732 ], in view of Ebrahim et al. [ US Patent No. 5848423 ], and further in view of Brown et al [ US Patent No 6295643 ].

25. As per claim 29, Bak and Ebrahim do not disclose the class loader obtains the classes from an HTTP server that exports a set of class files containing one or more of the classes. Brown discloses the class loader obtains the classes from an HTTP server that exports a set of class files containing one or more of the classes [ 514, Figure 5 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Brown because it would allow class structure to be more easily maintained and portable for other systems to access.

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26. As per claim 30, Bak and Ebrahim do not disclose the virtual machine is provided with a class definition statement that specifies one or more URLs for the class files. Brown discloses the virtual machine is provided with a class definition statement that specifies one or more URLs for the class files [ col 1, lines 50-62 ]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Brown because it would allow class structure to be more easily maintained and portable for other systems to access.

27. As per claims 38 and 39, they are method claims of claims 29 and 30, they are rejected for similar reasons as stated in claims 29 and 30.

28. Applicant's arguments with respect to claims 20-46 have been considered but are moot in view of the new ground(s) of rejection.

29. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

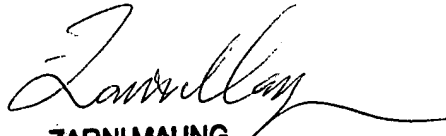
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dustin Nguyen whose telephone number is (703) 305-5321. The examiner can normally be reached on Monday – Friday (8:00 – 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directly to the receptionist whose telephone number is (703) 305-3900.

Dustin Nguyen

  
**ZARNI MAUNG**  
**PRIMARY EXAMINER**